

Invaders



Lionfish photo by Sandy Smith. Honorable mention in the 2007 N.C. Aquariums Underwater Photo Contest.

Lionfish (*Pterois volitans*) are native to the Indian and Pacific oceans. It was unclear as to why and how the fish had made its way to North Carolina, but by the winter of 2002, lionfish had been sighted at 19 locations off of the East Coast of the United States. The fish have stripes, fleshy appendages and spine-laden fins that make them quite impressive in appearance. Like many flashy or colorful animals, however, these characteristics are not meant to impress but rather to serve as a warning. The spines along the fins and back of lionfish are venomous and used in defense.

While divers are strongly advised not to handle the fish, swimmers are unlikely to have any encounters. The sightings off of North Carolina's coast have been between 18 and 40 miles offshore at depths of more than 100 feet.

Animal and plant species evolve together in an ecosystem, each filling a specific niche. When a new, non-native species appears on the scene, systems can be thrown off balance. Often invasive species pose a challenge to native species. They can pose a challenge to natural resource agencies as well.

Lionfish

In 2002, the N.C. Aquarium at Pine Knoll Shores opened a new exhibit featuring 10 to 15 beautiful lionfish in a 1,200-gallon cylindrical tank. You might think that "lionfish" sounds exotic. You would be right. The exhibit, called "Lionfish – Mysterious Traveler," would not have been considered for a North Carolina facility before 2000. That is when scuba divers exploring a shipwreck off of Morehead City reported seeing the unusual lionfish for the first time along North Carolina's coast.

Aquatic Weed Control

Invasive aquatic weeds can cause a lot of problems by becoming navigation hazards, impeding recreational activities, clogging water intakes, providing breeding habitat for mosquitoes and other pests and leading to flooding and erosion. The Aquatic Weed Control Program within the Division of Water Resources assists local governments with their aquatic weed issues through management and eradication operations and cost-share grants for projects. In 2004 alone, the program led projects that eradicated 4,000 acres of hydrilla, 63 acres of alligatorweed and 30 acres of creeping water primrose!

Rob Emens, manager of the Aquatic Weed Control Program, working out in the field. N.C. Division of Water Resources.



West Nile Virus

West Nile Virus originates from Africa, West Asia and Europe. It was first discovered in the United States in 1999 in New York City. It didn't take long for this exotic-sounding pathogen to become common in conversation. The first detection of the virus in North Carolina occurred in 2000. It has since been found in all contiguous states in the United States, north into Canada and south to Argentina.

Staff with the Public Health Pest Management Section of the Division of Environmental Health has been involved with research, prevention and education involving West Nile Virus from the very beginning. Their work has had a tremendous impact on the knowledge of and ability to deal with mosquitoes that transmit the virus. West Nile Virus is actually a bird virus. It is spread to humans and other animals through mosquitoes that have fed on an infected bird. Environmental Health staff initially focused on surveillance of sick or dead wild birds as they were initially tracking and learning about the disease. By 2003 they had shifted their focus to protecting citizens in North Carolina through precautionary measures and elimination of mosquito habitat.

It is important to know that the majority of people infected with West Nile Virus have no symptoms. Only 20 percent of people infected will develop West Nile Fever which is a mild illness that usually lasts for only a few days. Less than one percent of those infected will experience a severe infection called West Nile Encephalitis or meningitis. Regardless of the probability of infection, everyone should take the recommended precautions, and anyone with symptoms of the virus should see a doctor right away.



Capturing wild birds for West Nile Virus testing. Nolan Newton, N.C. Division of Environmental Health.

New Digs

The Department of Environment and Natural Resources continues to grow and enhance its resources and facilities. While doing so, it strives to improve programs and exhibits and be a model in sustainable development.



Queen angelfish in the Caribsea exhibit at the N.C. Aquarium at Pine Knoll Shores. Photo by Julie Powers, N.C. Aquariums.



N.C. Aquarium at Pine Knoll Shores. Photo by Scott Taylor.

Green from the Ground Up

In early 2008, three old government buildings were demolished to make way for two eco-friendly ones. So eco-friendly, in fact, that 98 percent of the rubble from the demolished buildings was either reused or recycled, keeping reusable material out of the landfill.

The \$134 million Green Square complex will be located in downtown Raleigh. It will include a four-story, 105,000-square-foot Nature Research Center, an expansion of the Museum of Natural Sciences, and a 146,500-square-foot building to house the headquarters of the Department of Environment and Natural Resources.

The Nature Research Center will engage the public and school groups in scientific research and environmental issues affecting our daily lives. "In the Museum of Natural Sciences, we're really focusing on what we know about North Carolina's environment," said Museum Director Betsy Bennett. "In the Nature Research Center, we're focusing on how we know what we know."

Both buildings will be models of environmentally-friendly design. Plans include maximizing the use of natural sunlight, conserving water through cisterns, reducing stormwater runoff, a green roof, low-emission paints and carpentry materials and using locally-produced building materials. Construction is expected to be complete in 2011.

Museum Director Betsy Bennett helps break ground for the Green Square Complex in April 2008 alongside Friends of the Museum president-elect, Tom Earnhardt. Jonathan Pishney, N.C. Museum of Natural Sciences.



Plans for DENR's Green Square Complex.



Aquarium at Pine Knoll Shores

On May 19, 2006, the N.C. Aquarium at Pine Knoll Shores reopened its doors following a \$25 million expansion. The renovation lasted 30 months, but it was definitely worth the wait. The theme of the renovated, 93,000 square foot facility is “North Carolina’s aquatic life from the mountains to the sea,” and that is exactly what visitors get to see. Five galleries represent the state’s five aquatic zones: Mountain, Piedmont, Coastal Plain, Tidal Waters and Ocean. After feeling the spray from a 32-foot Smoky Mountain waterfall, watching frolicking river otters, exploring a cypress swamp and getting an underwater view of a shipwrecked submarine, visitors feel as though they have gone from the mountains to the sea!

Living Shipwreck – This 306,000-gallon exhibit features a three-quarter-size replica of the coral-encrusted U-352, a German World War II submarine that the U.S. Coast Guard sank off of North Carolina’s coast in 1942. Visitors can watch sand tiger sharks, moray eels and schools of colorful fish that are typically drawn to offshore shipwrecks.

Tidal Waters Gallery – Here visitors can touch the inhabitants of the Skate and Ray Encounters exhibit. At the nearby Tidal Touch Pool, people get a chance to experience horseshoe crabs, hermit crabs, sea stars, sea urchins and whelks.

River Otters – Neuse and Pungo, the Aquarium’s two river otters, have been a favorite of visitors since opening day. These curious creatures are given plenty of items to explore and also get exercise and enrichment sessions. A third river otter, named Eno, arrived at the aquarium in April 2008.



River otter at the N.C. Aquarium at Pine Knoll Shores. N.C. Aquariums.



The Valerie H. Schindler Wildlife Learning Center at the Zoo

The North Carolina Zoo and Zoo Society recently worked together to create a new indoor habitat, but it’s not for any of the zoo’s animals. It’s for people! The Valerie H. Schindler Wildlife Learning Center will help meet the needs of college and university students who want to work or conduct research at the zoo. It will also serve as a residential center for zoo interns and be available for local businesses for meeting space and as a conference and retreat center.

The Valerie H. Schindler Wildlife Learning Center. N.C. Zoo photo.



A teacher looks for monarch eggs and larva on milkweed plants at Prairie Ridge. The center has become a popular place for teacher workshops. Mike Dunn, N.C. Museum of Natural Sciences.

Prairie Ridge

Nearly 40 acres of restored grasslands, wetlands and forested bottomlands are an oasis from the hectic pace of the everyday. Although it feels like a secluded haven, the Prairie Ridge Ecostation for Wildlife and Learning is located just 10 minutes outside of downtown Raleigh. The Museum of Natural Sciences’ Prairie Ridge opened in 2004. It serves as a resource for education and research as well as a model of renewable energy and sustainable living.

The outdoor classroom is made of engineered parallel strand lumber, used in place of old growth timber for the large beams. Recycled materials were used for the classroom’s foundation, and extra lumber was reused for other on-site projects and mulch. Flushing a toilet at Prairie Ridge is even an educational experience. North Carolina State University assistant professors Bill Hunt and Garry Grabow developed a research project to determine the efficiency of a cistern-driven plumbing system.

This natural laboratory also includes a pavilion with a green roof. Plantings on the roof reduce stormwater runoff from what would otherwise be an impermeable surface. Prairie Ridge’s Nature Neighborhood garden attracts butterflies and hummingbirds to native nectar sources. The garden is designed to be a place to enjoy nature and a place for education. “The most important part is that it’s interactive,” said Kim Smart, a museum educator and the project manager of the garden. “Children can splash in the pond if they want to, or explore the garden. I want them to learn, but I want it to be fun.”

Prolific Parks

It seems like the Division of Parks and Recreation is always providing visitors with new and improved experiences. Since 2001, new visitor centers were built at Hammocks Beach, Medoc Mountain, Jones Lake, South Mountains, New River and Dismal Swamp state parks as well as Jordan Lake State Recreation Area. More visitor centers are underway at Merchants Millpond, Cliffs of the Neuse, Raven Rock, Fort Macon and Gorges state parks.



Visitor center at South Mountains State Park in Burke County. N.C. Division of Parks and Recreation.

All Things Are Connected

"Tug on anything at all
and you'll find it
connected to everything
else in the universe."

John Muir

On the surface, it may seem unusual that an agency focused on forest resources would put its efforts towards protecting water quality. Why would a zoo spend time and energy toward restoring the native habitat of surrounding communities? In nature, all things are connected. Ecosystems function much like an organism, with each species playing a role and each component vital to the others. Agencies within the Department of Environment and Natural Resources realize this, and work to preserve the system as a whole.

In a Nutshell

In 2007, the N.C. Zoo's Horticulture Division worked with Trees Asheville on an initiative to reintroduce the American chestnut tree to the southern Appalachian region. The American chestnut is an extremely endangered species of tree due to its propensity to suffer from blight. It may seem odd for the zoo to be involved with local tree reintroduction, but the zoo has a history of taking part in projects focused on North Carolina's native plants and wildlife. After all, all things are connected...

N.C. Zoo arborists join with local students and conservation groups to plant endangered American chestnut trees. N.C. Zoo photos.



Raise a Glass to One-Stop Coordinators

When most people think of a winery, they don't think about wastewater, but that is one of the many things that a grape grower has to consider. Many agriculture-related operations clearly show the connections between various parts of the environment. Soil quality, water quality and human health are suddenly very obviously interconnected on a single field or pasture. This can sometimes make it difficult for those in the agricultural field looking for answers to know where to go.

Companies, local government agencies and producers often breathe a sigh of relief when they learn that the Department of Environment and Natural Resources has permit coordinators who will help them determine up front what permits are necessary for a given project. Regional one-stop permit coordinators also play the role of bringing together the necessary parties to find environmental solutions.

North Carolina has seen a rapid growth in vineyards and wineries in recent years, especially in the Piedmont region of the state. Grape growers were concerned about which of their wastewater operations were considered agricultural and which were commercial/industrial. Most of the wastewater was created in about a four-month period with little else the rest of the year. Were there options they had that would take this into account? How could they compost and reuse the grape-skin waste they produced?

It was the job of the one-stop coordinator in the Department's Customer Service Center to work with the Division of Waste Management, the Division of Water Quality and local wineries to review the processes and spell out environmental requirements. The results were a clearer understanding of permitting and waste management options for the wineries, as well as input on how the wineries could compost and reuse water. Drink your wine in gladness and compost your grape skins...because all things are connected!



North Carolina winery. N.C. DENR Customer Service.

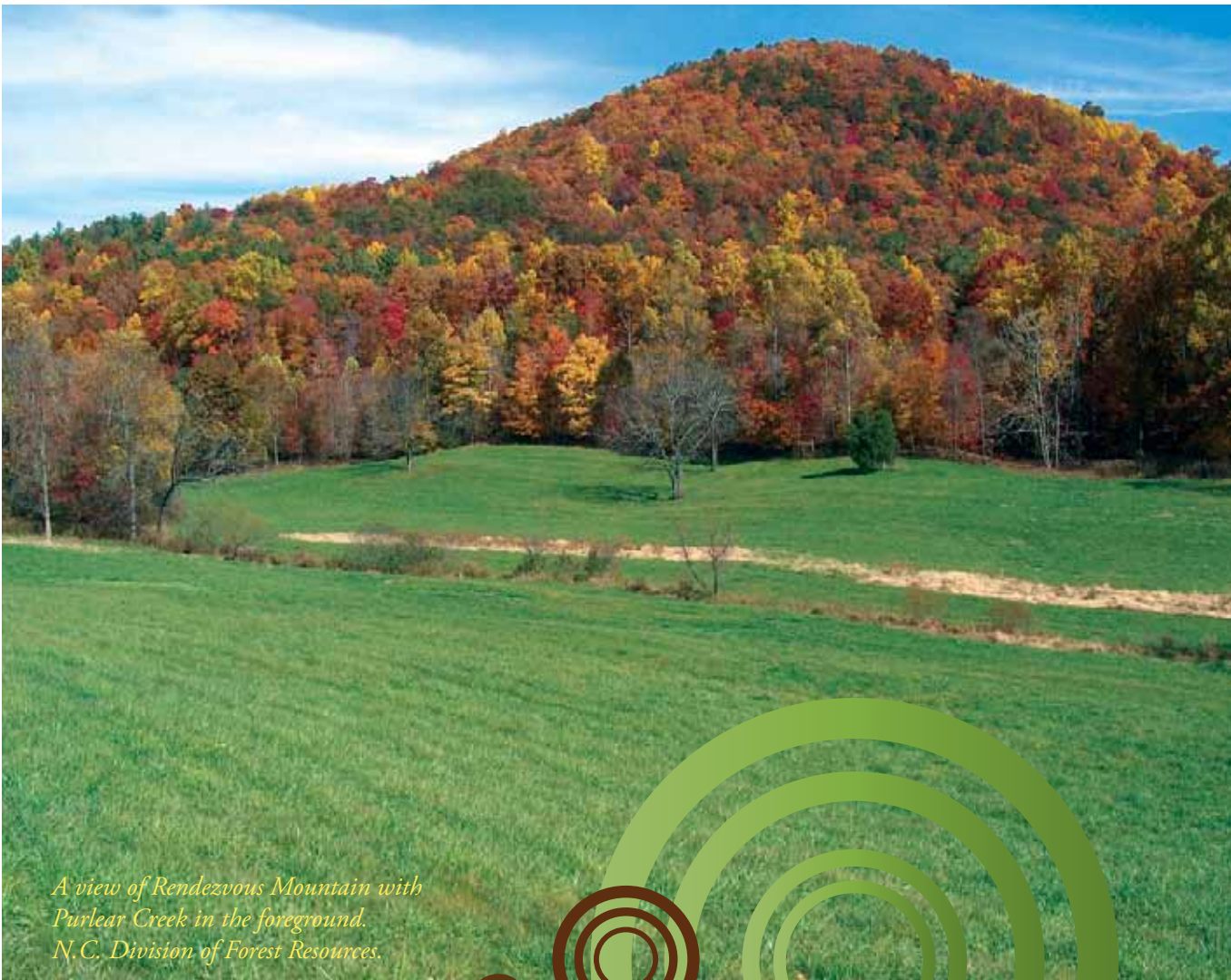
Restoring Purlear Creek

The forest rangers in Wilkes County knew and had great respect for Mozelle and B.N. Benton, a farming couple who owned 99 acres in the county. When Mr. Benton realized that his health was declining, he made it known that he would like his land to become part of Rendezvous State Forest, rather than be developed with houses and lose its natural beauty. The farm at the foot of Rendezvous Mountain had been grazed by cattle for many years. Purlear Creek, which ran through the farmland, showed the effects of the constant wear and tear of cattle hooves.

In December 2003, paperwork was signed that transferred ownership of the land to the N.C. Division of Forest Resources. The creek needed a lot of work, especially if it was going to be healthy enough to reach the ultimate goal – trout. The DFR foresters and rangers obtained technical advice and oversight from the North Carolina State University Department of Biological and Agricultural Engineering Stream Restoration Department.

By August 2007, the stream had been restored, reconfigured, relocated or otherwise rehabilitated. Trees and shrubs had been planted along its banks to form the beginnings of a riparian forest. Once these trees provide enough shade, the division will work with the N.C. Wildlife Resources Commission to evaluate the best method for trout reintroduction.

It might seem odd for the Division of Forest Resources to be leading a project in stream restoration. Streams, wildlife, fisheries and soil conservation are all part of healthy forests.



A view of Rendezvous Mountain with Purlear Creek in the foreground. N.C. Division of Forest Resources.

All things are connected...



Appendix

OVERVIEW OF THE DEPARTMENT

The mission of the N.C. Department of Environment and Natural Resources is to conserve and protect North Carolina’s natural resources and to maintain an environment of high quality, for the health, well-being and benefit of all, from the mountains to the sea. DENR and its 4,000 permanent employees and 2,300 seasonal employees strive to achieve that mission through four kinds of programs.

The department’s environmental protection and environmental health programs work to protect and maintain the high quality of the state’s air, water and land resources and also to protect the public health. The agency’s natural resource programs work to conserve and protect North Carolina’s forests and farms, parks and open spaces, greenways and trails, streams and rivers, sounds and oceans, and the plants and animals that make their homes in all those places. Educational institutions make up the third category of departmental programs. The department educates the citizens of our state about the importance of a healthy environment through the exhibits and programs of three aquariums, the Museum of Natural Sciences and the N.C. Zoological Park, as well as through educational programming provided by other parts of DENR and in partnership with other organizations. The fourth kind of departmental program is the group of essential offices that supports the work of all the other DENR programs. Budget, purchase and services, and human resources are examples of divisions in this fourth category.

This overview would not be complete without two other observations. First, none of these DENR programs operates in a vacuum. Each depends on a wide range of partners, in and out of the department and in and out of government, to accomplish its mission. When the partners work together, the job gets done. Second, the work of the department and its partners is important to our state and its people. At the bottom line, a healthy environment and healthy natural resources are essential to healthy communities and a healthy economy, and to the health, well-being and benefit of all our citizens.

THE DEPARTMENT’S STRATEGIC PLAN 2008-2009 (as revised May 13, 2008)

The department’s most recent strategic plan is set out below. The purpose of the plan is to lay out the steps (i.e., “strategic directions”) and code of conduct (i.e., “values”) that will enable the department to accomplish its mission and vision. The strategic plan will now need to be revised and updated to reflect the new administration’s priorities, including priorities for the 2009 budget and legislative session, and to respond to the challenges, opportunities and emerging issues that the new year and the new federal administration bring with them.



Pitcher plant flower. N.C. Zoo photo.

MISSION: To conserve and protect North Carolina’s natural resources and to maintain an environment of high quality, for the health, well-being and benefit of all.

VISION: North Carolina: Green and Growing!

VALUES:

1. Integrity
2. Accountability
3. Commitment to mission, vision and values
4. Respect
5. Quality
6. Knowledge of external environment
7. Working together: teamwork and partnerships

STRATEGIC DIRECTIONS

1. One North Carolina Naturally: statewide land and water conservation initiative
 - a. Planning, mapping and guidance for statewide conservation
 - i. Continued development and use of Conservation Planning Tool
 - b. Spending authorized funds wisely and well
 - c. Stewardship of conservation lands
 - d. Coastal Habitat Protection Plan implementation
 - e. Waterfront access implementation
 - f. Conservation on private lands
 - i. Forestland
 - ii. Farmland
 - g. DuPont State Forest: plan for the future
2. Advancing organizational effectiveness
 - a. Green Square
 - b. Beacon
 - c. IT consolidation
 - d. Diversity
 - e. Performance solutions
 - f. Building internal auditing capacity
 - g. GICC recommendations for geospatial data sharing
3. Water for the future
 - a. Enactment and implementation of Governor Easley’s three-part drought legislation proposals
 - i. Modernize public water systems
 - ii. Promote water conservation and efficiency
 - iii. Improve our ability to respond to water emergencies
 - b. Protecting our waters
 - i. Coastal stormwater rules

- ii. Jordan Lake watershed rules
 - iii.ERC’s Water Allocation Study
 - iv. CAMA issues, including enforcement of rules requiring removal of sandbags for erosion control after 2-5 years
 - v. Plan for sustainable water use by river basin
- 4. Advancing environmental education
 - a. Zoo: advance capital projects
 - b. Museum of Natural Sciences: Nature Research Center
 - c. Environmental education:
 - i. Certification program improvements
 - ii. State environmental education plan
 - d. Aquariums: advance 3 pier projects
- 5. Improving air quality and responding to climate change
 - a. Lead NC effort on important rulemaking, e.g., change in ozone standard
 - b. Set up organizational vehicle to guide and sustain DENR’s efforts to respond to climate change
 - c. Participate in Climate Registry
- 6. Progressing toward sustainability
 - a. Advance state – military partnerships
 - i. SERPPAS
 - ii. Sustainable Sandhills – BRAC RTF – RLUAC
 - iii.Onslow Bight Conservation Forum
 - b. Land conservation and place-based economic development initiatives along Catawba / Johns rivers and Yadkin / Pee Dee River
 - c. Advance the Environmental Stewardship Initiative
 - d. Pursue SC/NC project on mercury
 - e. Support development of EMC recommendations on regulation of alternative energy sources
- 7. Protecting groundwater and restoring contaminated properties
 - a. Implement solid waste disposal tax (effective July 1)
 - b. Initiate program to identify, assess, and remediate old landfills
 - c. Improved management of contaminated sites (development of a consistent protocol for on-going groundwater monitoring)

THEMES / PRIORITIES FOR 2008 BUDGET AND LEGISLATIVE SESSION

- 1. Water for the future
- 2. One North Carolina Naturally
- 3. Advancing organizational effectiveness



UPDATES ON ISSUES IN VARIOUS DENR PROGRAM AREAS

Managing Waste

Solid Waste

The latest available statistics show a steadily increasing state per capita disposal rate – disposal is up 25 percent from the FY 91-92 base year. North Carolina communities created nearly 12 million tons of waste, which were disposed of in both North Carolina and out-of-state facilities. It is forecast that in 10 years, North Carolina will need the landfill capacity to dispose of just over 15 millions tons of waste annually (http://www.wastenotnc.org/SWHOME/AR06_07/AR06-07.pdf). Clearly, as a state, we need to increase our recycling efforts. The department is trying to encourage that increase through its “2 Million Tons by 2012” initiative. For more information, see <http://www.p2pays.org/press_releases/101308.pdf>.

Hazardous Waste

To date, the Inactive Hazardous Sites Program has catalogued 2,972 chemical spill or disposal sites and old, unlined dumps or landfills that are not being addressed by other environmental authorities. Of this number, 2,536 still require work to address their hazards.

Of the 2,972 site total, 669 are old non-permitted unlined landfills requiring action. These landfills pose threats from contaminated groundwater reaching drinking water wells and from hazardous substances and methane vapors off-gassing from the waste and contaminated groundwater, making it into structures on or near the landfill and thereby posing health threats and explosion hazards. Based on inspections of these sites, 64 percent have a residence, school, church, day care or drinking water source on or within 1,000 feet of the landfill. There are currently 165 landfills that have drinking water wells within 500 feet, 32 that have residences on the landfill, 53 with structures other than residences, and many others with sensitive uses such as parks. Based on observations at sites investigated by the U.S. EPA and the N.C. Division of Waste Management, most of North Carolina’s unlined landfills can be expected to have groundwater contamination.

Senate Bill 1492, enacted in 2007, established a statewide tax on waste disposal. Some of the funds generated by this tipping fee will be used to address the hazards posed by these old non-permitted landfill sites. The provisions of the bill which relate to the assessment and abatement of contamination at these non-permitted landfills went into effect July 2008. The first proceeds of this tax are expected to be provided to the division in February 2009.

Limited funds are available for non-landfill orphan site assessment and cleanup. The Inactive Hazardous Sites Branch has been able to collect some funds through bankruptcy claims for a few sites. All currently available funds are dedicated to specific site actions. However, the budget bill (HB2436) authorized the transfer of \$400,000 from the Dry Cleaning Solvent Cleanup Fund to the Inactive Hazardous Sites Cleanup Fund to assess and clean up contaminated sites or to provide alternate sources of drinking water to contaminated private wells. Approximately 100 sites have one or more contaminated drinking water wells and no identifiable responsible party. Once the funds are transferred, the \$400,000 will be used to address some of these cases. The funds will be sufficient to address only a portion of the cases.

Improving Air Quality

Smog, Tiny Particle Pollution, Acid Rain and Haze

In 2002, Gov. Easley signed into law a landmark piece of air quality legislation, the Clean Smokestacks Act. The act addresses emissions from 14 coal-fired power plants that contribute to smog, tiny particle pollution, acid rain and regional haze. The act set deadlines for the state’s major utility companies to substantially reduce emissions from their coal-fired power plants. The implementation of the Clean Smokestacks Act is on target and on schedule. (<http://www.ncuc.commerce.state.nc.us/reports/csa2008.pdf>) So far, Duke Energy and Progress Energy have met or exceeded the act’s 2007 caps on nitrogen oxides (NOx), and they are on target to meet the 2009 caps on NOx and sulfur dioxide. In meeting these requirements, the utilities have installed the state’s first large-scale scrubbers (which remove sulfur dioxide and mercury) on coal-fired power plants in Buncombe, Catawba, Person and Stokes counties with more units underway in Brunswick, Gaston, Person and Rutherford counties.

The Division of Air Quality, in cooperation with the state Department of Transportation, has also fully implemented a new program to reduce motor vehicle emissions that contribute to ozone pollution.

Mercury

North Carolina’s power plants must cut their mercury emissions substantially over the next 12 years or face shutting them down, under rules the state Environmental Management Commission adopted in 2006. The rules require 14 coal-fired power plants operated by Duke and Progress Energy to install controls for reducing mercury emissions. These emissions may have contributed to elevated levels of mercury in some fish from North Carolina waters. Ultimately, the rules could lead to nearly a 90 percent reduction in mercury emissions based on the levels of mercury contained in coal. The N.C. Division of Air Quality estimates that mercury emissions will drop by 74 percent when the Clean Smokestacks Act is fully implemented in 2013. Further reductions will occur by 2018, as facilities not covered by the Clean Smokestacks Act add controls under the new mercury rule.

Conserving and Protecting Water Resources

Drought Management Actions

The Department of Environment and Natural Resources worked hard to improve water supply management and drought response during the drought of 2007-2008. With Gov. Easley’s active leadership, the department and others pushed for drought response legislation in the N.C. General Assembly. The Drought Management Act of 2008 (<http://www.ncwater.org/drought/>) enhances the ability of the governor and local communities to respond to worsening drought conditions and encourages greater water supply planning, conservation and cooperation. The new law also streamlines the process for declaring a drought emergency. Under the new law, the Department of Environment and Natural Resources gained the authority to require water systems to implement water conservation measures in situations of “extreme” or “exceptional” drought and to step up the level of water conservation if existing measures are not sufficient. The legislation takes steps to improve the quality and amount of information about water use available to state and local agencies for planning purposes.

DENR spent several million dollars in 2007-2008 directly for drought response projects (including emergency actions to assist Rocky Mount and Siler City). The N.C. Rural Economic Development Center provided \$500,000 to each water system to fund interconnections (Siler City to Sanford and Rocky Mount to Wilson). DENR provided technical assistance and expedited permits for those projects and a number of others to provide interconnections between water systems or emergency water supplies in 2007-2008.

Both the N.C. Rural Economic Development Center and the Department of Environment and Natural Resources gave priority to drought response projects in allocating grant and loan funds for water infrastructure. Additional drought response projects included: Boone/Blowing Rock/Appalachian State University interconnections; Mars Hill/Weaverville interconnection; and regional interconnections between Hendersonville, Saluda, Tryon and Columbus. In 2007-2008, the state committed more than \$16 million in funding for drought-related interconnection or emergency water supply projects (\$6.6 million in grants from the N.C. Rural Economic Development Center and \$9.4 million in low interest loans from the N.C. Drinking Water Revolving Loan Fund). DENR provided technical assistance on water conservation and efficiency to approximately 70 commercial and industrial facilities, and also set aside \$500,000 to assist 22 water systems with water audits and leak investigations. The 2008-2009 state budget included a \$600,000 drought reserve fund to continue assistance with water audits; provide additional seed money for drought response projects; and fund water conservation education materials.

Water Quality

Progress toward reducing water pollution in the state’s surface waters is being made in many areas; in other areas pressures on the environment continue to grow.

Data collection is the key to the Division of Water Quality’s identification of impaired waters. Both the quality and quantity of water quality data has increased. Collection methods and guidance have improved so that the water samples have more reliable quality control. Data collected by the Division of Water Quality has been supplemented in recent years by data provided by local governments, monitoring coalitions and numerous state agencies.

Improvements have been seen in the reduction of all sources of pollution in some areas. Technological improvements in wastewater treatment control have resulted in significant reductions of pollutants. Better understanding of non-point source pollution – pollutants that enter surface waters from many different land use activities –has led to improvements in controls for stormwater runoff, agricultural operations and land-based waste disposal. Increased cooperation between local businesses, city and county government agencies, environmental groups and state agencies have also resulted in numerous watershed improvements through increased monitoring, elimination or mitigation of sources of pollution and implementation of best management practices. As one example, the Neuse River has shown significant improvement as tighter controls on wastewater discharges and better stormwater management in the river basin succeeded in reducing the high nutrient levels that caused fish kills in the 1980s.

Coastal Stormwater Rules

The coastal stormwater rules adopted by the Environmental Management Commission in the late 1980s were intended to protect coastal waters from the impacts of runoff from developed areas. Starting in 2005, the Division of Water Quality undertook a comprehensive review of the coastal stormwater program’s effectiveness. The study concluded that the existing Coastal Stormwater Rule was outdated and ineffective in providing an adequate level of environmental protection to the coastal ecosystem. In response to this finding, the EMC amended the rules to provide further protection. In 2008, the General Assembly adopted a modified version of the EMC’s rules. The new rules should improve the management of coastal stormwater and the protection of our coastal waters.

Safe Drinking Water

Bernard Allen Emergency Drinking Water Fund. In 2006 the General Assembly created the Emergency Drinking Water Fund as a program to improve the state’s response to groundwater contamination that affects drinking water wells. The fund provides assistance to low income households that need a safe and clean drinking water supply to replace a contaminated well. The fund received a \$300,000 appropriation in 2006 and a \$615,000 appropriation in 2007. The General Assembly did not appropriate any money to the fund in 2008.

The legislation establishing the fund outlined three authorized uses: 1) to notify citizens whose wells are at risk from groundwater contamination; 2) to pay for water quality testing of private wells; and 3) to provide an alternative drinking water supply to well owners whose wells are contaminated. The legislation directs DENR to disburse the money based on financial need and on the risk to public health.

Since its inception the program has served a critical need to the citizens of North Carolina. Dozens of residents throughout the state have benefited from the fund, either through a permanent connection to public water supplies or through the receipt of emergency bottled water until a long term solution is found. The department continues to work with local governments to identify eligible sites where the fund may be able to assist residents affected by contaminated groundwater.

In December 2007 the Division of Water Quality was notified of potential drinking water concerns in Montgomery County. DWQ sampled the well in question and by January 2008 began expanding the geographic scope of its sampling. Sampling results indicated that approximately three dozen wells in the area contained pesticide compounds above the drinking water standard, apparently the result of past practices in growing peaches.

DWQ began working with local officials and the U.S. Environmental Protection Agency to identify a short-term and long-term solution to the contaminated wells. In April 2008 residents were supplied with bottled water paid for through the Bernard Allen Fund. DWQ is continuing to conduct sampling in nearby areas, and local officials have been working with the N.C. Rural Center and other funding agencies to secure funds for a waterline extension project, with an initial cost estimate of more than \$1.2 million.

Private Well Legislation. About 2.7 million North Carolinians rely on wells for their drinking water. In 2006, the General Assembly passed a new law that requires counties to enforce minimum statewide standards through local well programs with the use of permits and inspections. Before receiving final approval for drinking, well water will be tested for 17 different possible contaminants as well as for bacteria and acidity. The law included \$1.1 million to help counties get these programs up and running. The Division of Environmental Health will help counties enforce standards and assist them in starting new well inspection programs; all counties were required to have local well program in place by July 2008.

Conserving and Protecting Land Resources

Sedimentation Control

The number of new sedimentation and erosion projects approved this past fiscal year decreased, probably reflecting the slowdown in the national economy. The growth of delegated local erosion and sediment control programs is also taking a portion of the new projects formerly overseen by the state. Two new local programs were added during this last year. The proportions of sites requiring a Notice of Violation was down slightly from previous years. Other improvements in the works for the State Sedimentation Control Program include updates to the “Erosion and Sedimentation Control Design Manual” published by the Sedimentation Control Commission. The updates will reflect the newest technology. Additionally, rulemaking has begun for the purpose of implementing a new provision in the law requiring self-inspection for erosion and sedimentation control.

Development on steep slopes has become an increasing concern in recent years. In 2004, rains associated with hurricanes Ivan and Frances caused landslides that destroyed or damaged several homes and resulted in deaths and injuries. Several projects in the mountains of North Carolina caused sedimentation problems this past year when the slopes were graded too steeply and became unstable, resulting in the failure of erosion and sedimentation measures and offsite sedimentation damage. Several local governments have addressed steep slope development in their local erosion and sedimentation control ordinances, or have passed separate steep slope ordinances to better address long term erosion and sedimentation control for this type development.

One North Carolina Naturally: Conserving and Protecting Open Space

Through the end of 2007, public and private partners have joined together since the inception of the Million Acres Initiative in 1999 to conserve and protect 589,685 acres of land on a permanent basis.

The lands protected in 2007 represent important natural areas for habitat, recreation opportunities, working forests and streamside buffers. Notable projects completed in 2007 include the addition of the 996-acre Chimney Rock Park to the State Parks System, a 1,088-acre conservation easement conveyed from the town of Sylva to the state of North Carolina on the largest remaining unprotected tract in the Plott Balsam Mountains, and the transfer of nearly 60,000 acres of former International Paper land from The Nature Conservancy to the state. In the last several years, the pace at which our state is protecting and conserving open space has increased.

Nevertheless, the amount of land currently protected each year is insufficient to meet the goal of permanently protecting an additional million acres by Dec. 31, 2009. In fact, at our current pace, land protection efforts do not match the rate at which natural and agricultural lands are being lost to development in North Carolina, which currently amounts to about 100,000 acres per year. At the current average rate of land protection and funding levels, we will reach the million acre goal in 2014.

In addition to increasing the rate at which land is protected in North Carolina, the department, through its One North Carolina Naturally program and working with many partners, has made available high quality information and tools to support effective conservation planning and action. The most significant improvement in this area is the statewide Conservation Planning Tool, introduced in 2007. The Conservation Planning Tool is a comprehensive reference that provides accurate information to support land use and conservation planning and action. It uses scientific and strategic analysis to identify and prioritize the essential high quality natural resources across the state, as well as identify crucial protection gaps in our state’s network of supporting ecosystems. The plan highlights opportunities for collaborative conservation that will contribute to conserving and protecting the most significant natural resources across the state.

The Conservation Planning Tool can help all the state’s conservation partners conserve and protect the most important natural resources, optimize available funding and make the case for closing the gap between what we have and what we need. Working together, we can achieve the goal outlined in the statute that sets the million acre goal: “to protect the water quality, wetlands, drinking water sources, natural beauty, and ecological diversity of North Carolina as well as provide opportunities for public recreation” in order to “provide a high-quality environment for present and future generations.”

A NEW YEAR, AND THE PATH AHEAD

Challenges and Opportunities

On Dec. 23, 2008, the News and Observer published an article entitled *N.C. Grows Despite Downturn*. In part the article stated as follows:

“North Carolina’s population continued to grow in the year ending July 1, 2008, despite the drag of an already-faltering economy, according to the latest estimates released Monday by the U.S. Census Bureau.

The state added more than 180,000 residents during that year, growing at a rate of 2 percent – the fourth highest in the nation and more than double the national growth rate.

That growth boosted North Carolina’s population to more than 9.2 million, the Census Bureau said. Still, that was a smaller increase than the state experienced in the prior two years.”

Although in different ways, a growing population and a faltering economy both mean increasing competition for increasingly scarce resources. A changing climate and an energy crisis both raise the stakes and pace of the competition for the scarce resources. Around the state and around the world, it is a time of great risk and challenge, but also of great hope and opportunity.

Against that background, here briefly summarized are some of the major environmental and natural resource policy issues facing the department and the state in the new year:

Military Expansion and Partnerships. One important reason for the growth in North Carolina’s population is the growth of the military presence in our state. For example, at both Camp Lejeune and Fort Bragg, the military presence is expanding dramatically and quickly. Planning for and accommodating that growth is a complicated but essential task that must involve the military, the state, local communities and many other diverse partners. Partnerships for planning and sustainability have already made key contributions to solving the problems and seizing the opportunities raised by these expansions, and are poised to be work even more effectively in the future. One such partnership is the Southeast Partnership for Planning and Sustainability, or SERPPAS, a partnership among the military, five southeastern states, federal agencies and other partners. SERPPAS has related work groups focusing on projects specific to North Carolina.

Climate Change and Energy. The N.C. Division of Air Quality’s work with the Climate Action Panel Advisory Group has been completed with the submission of the CAPAG final report in 2008. In recent years, DAQ has also supported the work of the Legislative Commission on Global Climate Change and helped organize the Climate Registry. While DAQ will continue its work on climate change in various capacities, it is important that the department evaluate its overall approach to this issue and develop an internal structure that allows for a more robust and focused approach to addressing climate change and energy issues at the state level while at the same time integrating and coordinating with developments at the federal level.

Interstate Air Pollution Rules. The state will need to respond to numerous significant U.S. EPA rules on air quality, such as, for example, the tightening of the federal ozone standard.

Water Supply. The Environmental Review Commission of the General Assembly has a study of water supply, allocation and permitting issues underway. An interim report will be provided in 2009 and final report in 2010. DENR’s Division of Water Resources, Division of Water Quality, the Public Water Supply Section in the Division of Environmental Health and the Secretary’s Office have all been involved in developing the scope of the study and providing information. The study could lead to recommendations affecting a number of DENR regulatory, planning and funding programs related to water supply.

Drought Management Implementation. With passage of House bill 2499, Drought/Water Management Recommendations, the legislature provided the state with enhanced tools to use in drought situations. First and foremost among those new tools is state authority to provide oversight for development and implementation of local water shortage response plans. Local water systems are required to develop plans to address water shortages that may result from drought or other conditions creating a water shortage emergency. The new law also requires the water systems to implement the plans in a water shortage. In December 2008, the Division of Water Resources will begin reviewing water shortage response plans submitted by the water systems. Plans that meet the statutory criteria for an acceptable plan will be approved; some number may need to be returned for additional work. In addition, implementation of the bill will involve collection of additional data on water use, support for local water systems working on interconnections and backup water supplies, improving water efficiency and increased public education on water conservation.

Solid Waste Management Act Implementation. In 2007 the General Assembly passed the Solid Waste Management Act of 2007. Included in this legislation was the imposition of a \$2 per ton tip fee that will generate more than \$20 million annually with a significant portion of that revenue dedicated to cleaning up the more than 700 old abandoned landfills throughout the state. The Department of Revenue began collecting the tip fee July 1, 2008. DWM is in the process of putting together a plan to prioritize assessments and cleanup.

Groundwater Contamination. Over the next several years the department needs to work with the legislature, other agencies and relevant commissions to strengthen the state’s management of groundwater resources. Incremental progress has been made in recent years with the passage of Gov. Easley’s private drinking water well legislation and a more coordinated approach to risk assessment between DENR and DHHS. The department is working on a comprehensive database that will provide a single source of information concerning all of the contaminated sites known to DENR’s water quality, public health and waste management agencies. The public will gain access to information about the location of these sites and the nature and extent of contamination at each site.

Coastal Issues. At the direction of the Coastal Resources Commission, the Division of Coastal Management has begun an enforcement initiative related to use of sandbags for temporary erosion control. The commission’s rules only allow use of sandbags for a 2-5 year period (depending on the size of the structure that is threatened by erosion) to allow recovery of the beach or an acceptable long-term solution such as relocation of the structure or beach nourishment. Many sandbags on the ocean shoreline have been in place much longer than the rules allow without any progress toward an acceptable permanent solution. The department may need to respond to a renewed effort to modify the state’s ban on use of hardened erosion control structures (such as seawalls, jetties and groins) on the oceanfront. Changing federal policy on offshore oil and gas exploration and interest in construction of wind turbines for electric generation will also raise issues that the state’s coastal management program will be required to address.

Jordan Lake Rules. The Jordan Lake rules are intended to reduce nutrient pollution, both nitrogen and phosphorous in Jordan Lake. The targeted sources of pollution include wastewater treatment plants, new development, existing development, agriculture and the N.C. Department of Transportation. The rules were approved by the EMC in spring of 2008 and then approved by the Rules Review Commission following an initial rejection. However, the RRC has received the requisite number of objections from the public to ensure that the rules will be subject to legislative review in 2009. The Jordan Lake rules are strongly opposed by affected local governments and the development industry. The rules will likely be subject to a legislative stakeholder group.

Renewable Energy. With the passage of Senate bill 3 in 2007, North Carolina became the first state in the Southeast to establish a renewable energy portfolio standard. This legislation has led to a wealth of activity in the area of renewable energy. The EMC has been evaluating current environmental programs and whether they provide sufficient safeguards for these new renewable facilities. In addition, the legislative Environmental Review Commission has been directed in the 2008 Studies bill to study the need for a wind permitting program at the state level. Specific wind projects have already been proposed, prompting some local governments to enact local moratoriums on wind farms. Also in this arena, a company that converts poultry litter to energy is proposing three sites in North Carolina to construct new facilities. North Carolina clearly has an opportunity to establish itself as a leader in the field of renewable energy, but the regulation and implementation of these efforts and others at the state and local levels will present a significant challenge.

Animal Operations. N.C. State University’s multi-year study on environmentally superior technologies for swine farms to replace the lagoon and sprayfield waste systems concluded with a final report in early 2006. The study identified some alternatives to the existing waste treatment systems but did not find them to be economically feasible at this time. Nevertheless, work continues to move forward in this area, including new regulatory standards for new and expanding swine farms as outlined in Senate bill 1465. The EMC is in the process of promulgating new rules on this issue starting this fall with public hearings. The discussion of these rules is likely to continue into 2009.

Land Conservation. In recent years the General Assembly has made funding of land conservation a priority. Despite these funding efforts, the goal of preserving and protecting 1 million acres in 10 years will fall short. However, recent funding efforts have ensured that important projects, such as acquisition of Chimney Rock Park and Grandfather Mountain, were successful. The funding of open space projects is especially critical to the Division of Parks and Recreation given its long-term expansion plans.

With revenue pictures already a concern for next year’s state budget, the department and the funding agencies will need to continue to develop innovative approaches to protecting our open space. In addition, staff and resources will need to be allocated to build on the progress the department has made through its conservation planning tool. As population growth continues at a rapid pace, the conservation planning tool has the potential to serve as a critical resource for local governments and planners.

Coastal Habitat Protection Plan. While implementation of the CHPP has been ongoing for several years with notable successes – such as the coastal stormwater rule and the development of strategic habitat areas – much work needs to be done to address the threats facing our coastal resources. Increased communication and coordination at the division level and the commission level have been hallmarks of the CHPP program. Over the next year a reassessment of the implementation priorities and resource allocation will be pivotal in maintaining positive momentum.

Emergency Response. The department’s ability to respond to emergencies of varying type will be critical to its mission in the upcoming years. For example, the Evans Road fire that burned in the eastern part of the state for three months in 2008 taxed both the department’s staff and financial resources. Other emergency events, whether slow-moving like the drought or immediate like Hurricane Floyd, the Apex chemical fire or landslides, are likely to occur. Only advanced planning and preparation and coordination among state, federal and local agencies will ensure an effective response

In Our Nature

The State of the Environment in North Carolina



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